

5.5

#1

$$f(x) = x^3 - 2x + 3$$

$$a = 2$$

$$f(2) = 8 - 4 + 3 = 7$$

$$f'(x) = 3x^2 - 2$$

$$f'(2) = 10$$

$$x=2$$

$$a=2$$

$$y - 7 = 10(x - 2)$$

$$L(x) = 10(x - 2) + 7$$

Part a

Estimate $f(2.1)$ using $L(2.1)$

$$f(2.1) = (2.1)^3 - 2(2.1) + 3$$

$$= 9.261 - 4.2 + 3$$

$$= 5.061 + 3$$

$$= 8.061$$

$$L(2.1) = 10(2.1 - 2) + 7$$

$$= 10(.1) + 7$$

$$= 1 + 7$$

$$= 8$$

Part b conclusion
 $L(2.1)$ is 0.061 away from $f(2.1)$

$$\begin{array}{r} 4.41 \\ 2.1 \\ \hline 441 \\ 8820 \\ \hline 9.261 \\ 4.2 \end{array}$$